

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS

-1-(Currently Amended)

1 A mesostructured crystalline hydrated alumina
2 composition ~~which is microporous~~ and consists essentially
3 of boehmite with atomically ordered crystalline
4 framework walls forming mesopores, without amorphous
5 hydrated alumina, and exhibiting at least one low angle
6 x-ray diffraction line corresponding to a lattice spacing
7 of at least 2.0 nm and multiple wide angle x-ray
8 diffraction lines with CuK α radiation wherein λ is 0.1541
9 nm and the boehmite particularly has characteristic 2 θ / $^{\circ}$
10 diffraction lines of the multiple wide angle lines as
11 shown in Figures 2 and 5 marked "As-made" and 7B marked
12 "MSU-S/B" corresponding to an ordered lattice comprised
13 of oxygen atoms and hydroxide groups with aluminum in
14 interstitial positions within the lattice, wherein the
15 surface area is at least 200 m²/g; and wherein the pore
16 volume is at least 0.40 cm³/g, wherein the boehmite is
17 formed by mixing a precursor amorphous hydrated alumina
18 and an organic modifier which forms the mesostructure and
19 then heating the mixture so that the boehmite is
20 completely formed and then removing water and the organic
21 modifier to provide the composition which can be calcined
22 to form a transition alumina.

Attorney Docket No. MSU 4.1-553
Appl. No. 09/917,147
Amdt. Dated: December 14, 2005
Response to Office Action of 08/22/2005

Claim 2 (Cancelled)

-3- (Currently Amended)

1 A mesostructured crystalline hydrated alumina
2 composite composition with mesopores containing an
3 organic modifier in the mesopores of the alumina wherein
4 the alumina composition consists essentially of boehmite
5 with atomically ordered crystalline framework walls
6 forming mesopores, without amorphous hydrated alumina,
7 and when the organic modifier is removed exhibits at
8 least one low angle x-ray diffraction line corresponding
9 to a lattice spacing of at least 2.0 nm and multiple wide
10 angle x-ray diffraction lines and the boehmite
11 particularly has characteristic 2θ° diffraction lines of
12 the multiple wide angle lines as shown in Figures 2 and
13 5 marked "As-made" and 7B marked "MSU-S/B" as made
14 corresponding to an ordered lattice comprised of oxygen
15 atoms and hydroxide groups with aluminum in interstitial
16 positions within the lattice, wherein the boehmite is
17 formed by mixing a precursor amorphous hydrated alumina
18 and the organic modifier which forms the mesostructure
19 and then heating the mixture so that the boehmite is
20 completely formed to provide the composition, wherein
21 when the organic modifier is removed, the composition can
22 be calcined to form a transition alumina.

-4- (Previously Amended)

1 The composition of Claim 3 wherein the organic
2 modifier is a non-ionic surfactant.

-5- (Previously Amended)

1 The composition of Claim 4 wherein the
2 surfactant is selected from the group consisting of a
3 polyethylene oxide block co-polymer, an alkylene amine;
4 an alkylene polyamine, a polypropylene oxide amine, a
5 polypropylene oxide polyamine and mixtures thereof.

-6- (Previously Amended)

1 The composition of any one of Claims 3, 4 or 5
2 wherein the hydrated alumina component is boehmite.

-7- (Currently Amended)

1 A mesostructured crystalline transition alumina
2 composition comprising gamma alumina and:

3 wherein the composition exhibits at least one
4 low angle x-ray diffraction line corresponding to a
5 lattice spacing of at least 2.0 nm and derived from a
6 boehmite with atomically ordered crystalline framework
7 walls forming mesopores, without amorphous hydrated
8 alumina, with multiple wide angle x-ray diffraction lines
9 with CuK α radiation wherein λ is 0.1541 nm and the
10 boehmite particularly has characteristic 2 θ ° diffraction
11 lines of the multiple wide angle lines as shown in
12 Figures 2 and 5 marked "as-made" and 7B marked "MSU-S/B"
13 as made corresponding to an ordered oxygen atom lattice
14 with aluminum in interstitial positions within the
15 lattice, wherein the surface area is at least 200 m²/g;
16 and wherein the pore volume is at least 0.40 cm³/g,
17 wherein the boehmite is formed by mixing a precursor
18 amorphous hydrated alumina with an organic modifier which
19 forms the mesostructure, heating the solution so that the
20 boehmite is completely formed, then removing water and
21 the organic modifier from the mesostructured boehmite,
22 and then calcining the mesostructured boehmite to form
23 the gamma alumina composition.

Attorney Docket No. MSU 4.1-553
Appl. No. 09/917,147
Amdt. Dated: December 14, 2005
Response to Office Action of 08/22/2005

-8-(Previously Amended)

1 The mesostructured transition alumina of Claim
2 7 wherein the transition alumina consists essentially of
3 gamma alumina.

Claims 9 - 26 (Cancelled)